

Waves, Sound, and Light:

- How is a wave created?
 - Vibrations of particles in the air
 - Some type of force that makes waves
 - Pulsating molecules
 - Disturbance in a medium
 - Energy being transferred from one "thing" to another
- ★ energy transferred in a repeating way

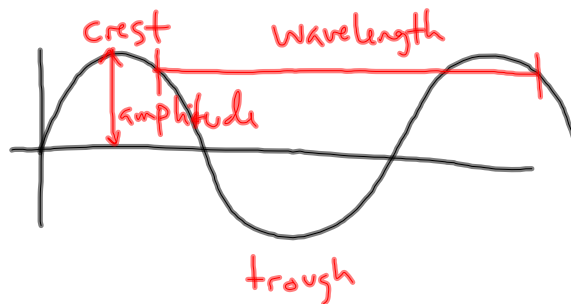
• Wave definitions:



Wave pulse

- medium: object through which a wave travels

- mechanical waves require a medium to travel



- Wavelength \rightarrow distance to complete one cycle
 λ (lambda) \rightarrow measured in meter

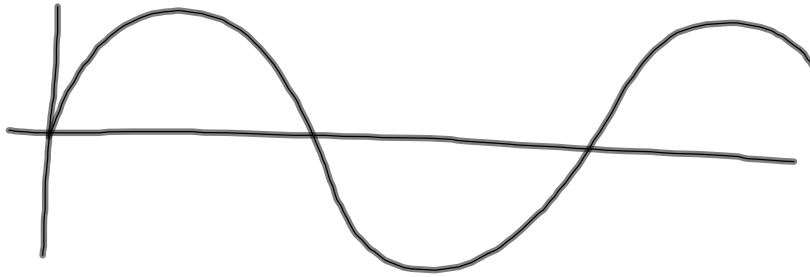
- period \rightarrow time it takes to complete one wave cycle
 $T \rightarrow$ seconds

- frequency \rightarrow number of waves per time
 $f \rightarrow \frac{1}{\text{seconds}} = \text{Hz}$
(Hertz)

- wave velocity: $V = \lambda f = \frac{\lambda}{T}$

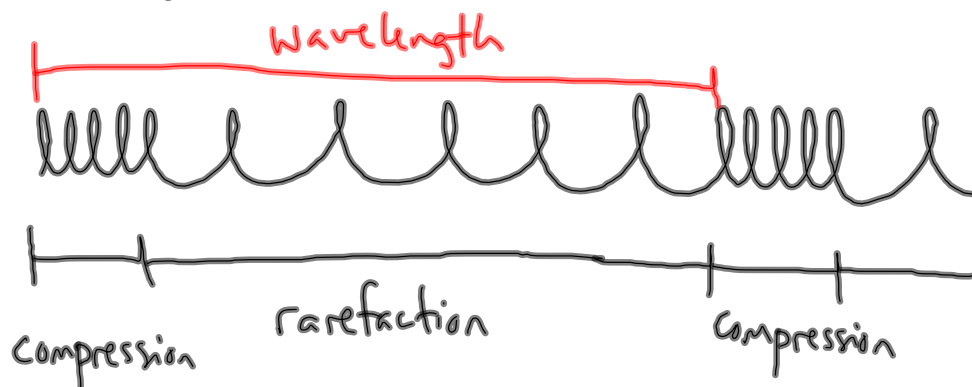
- Relationship between period and frequency: $T = \frac{1}{f}$
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- Transverse wave:



- We can model this as a sine curve
- amplitude is perpendicular to the wave motion

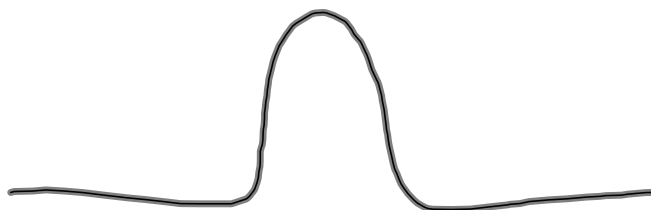
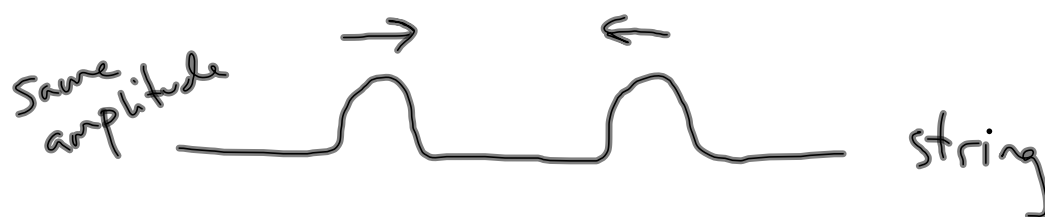
- Longitudinal wave:



- amplitude is parallel to the wave motion

- Wave combinations:

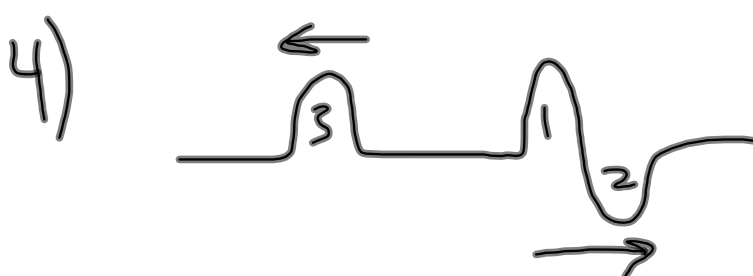
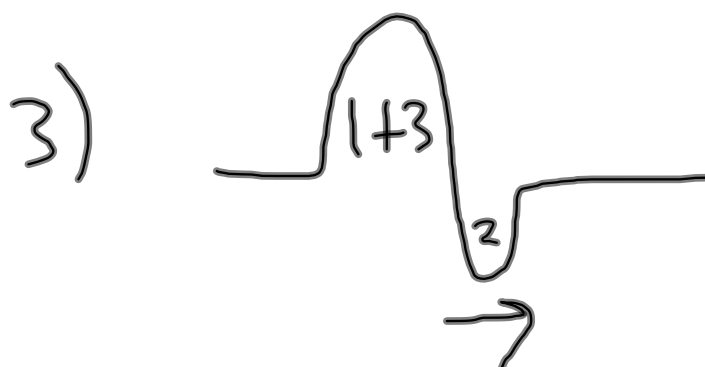
- Constructive interference:



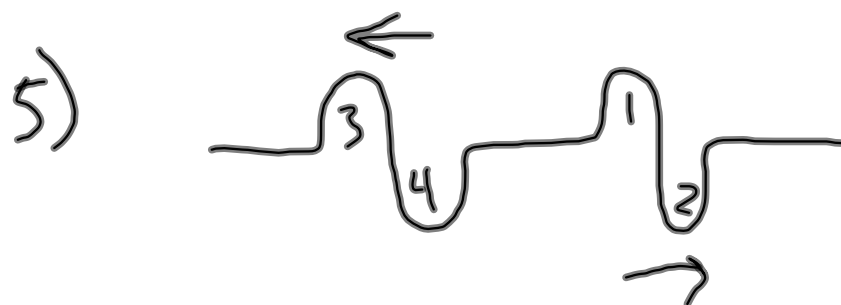
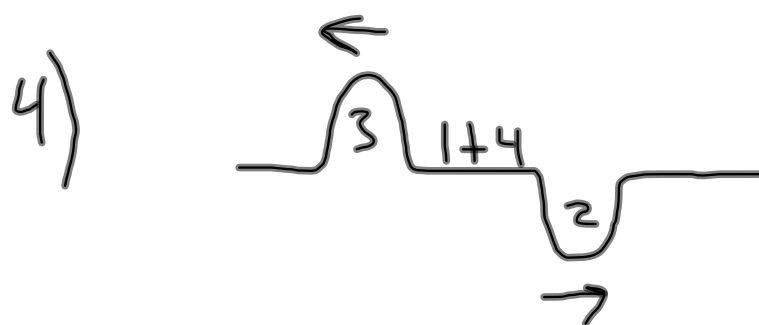
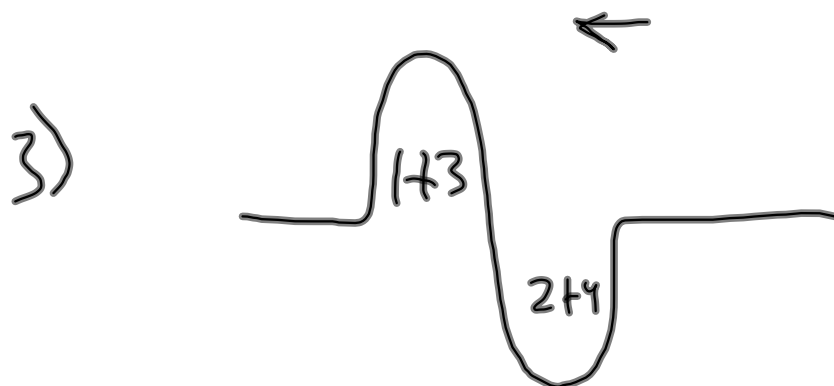
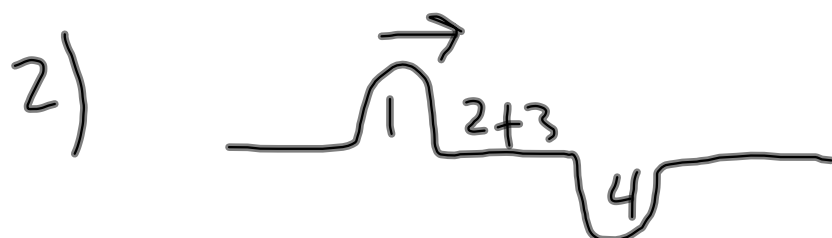
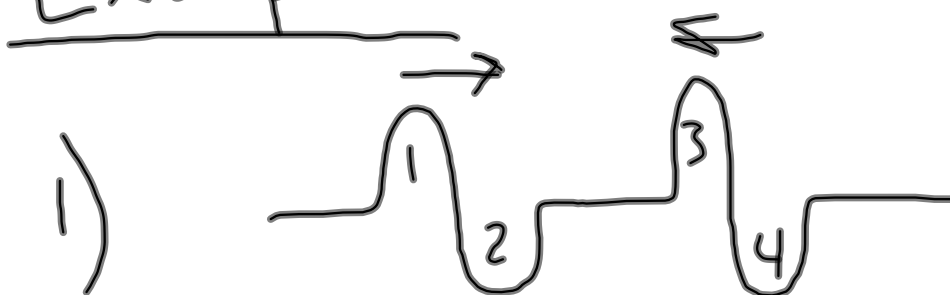
- Destructive interference:



Example:

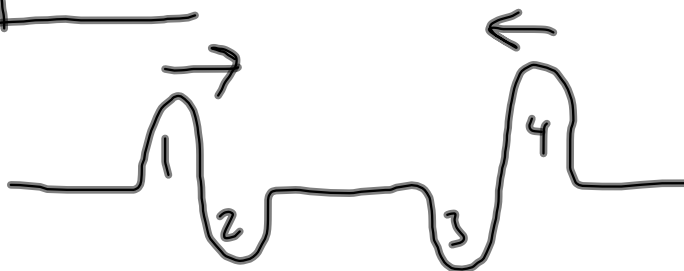


Example 2:

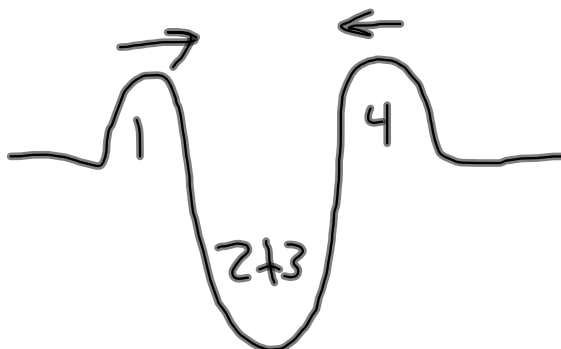


Example 3:

1)



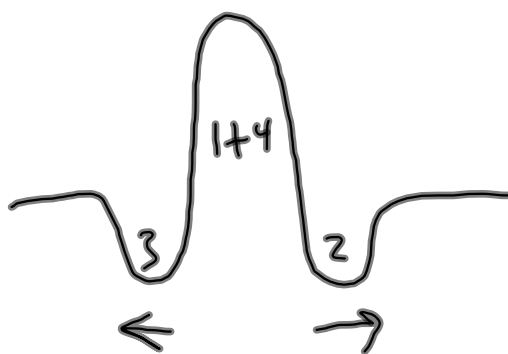
2)



3)



4)



5)

